

**- INTEROFFICE MEMORANDUM**  
**Revised – April 19, 2007**

**TO: Brian Lusher**

**Via: Scott B. Lutz  
Daphne Y. Chong  
Glen Long**

**FROM: Irma Salinas**

**SUBJECT: Results of Health Risk Screening Analysis for Eastshore Energy Center (Hayward, CA), Standby Generator Diesel Engine, and 14 Natural Gas Engines Plant #18041, Application #15195**

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Per your request, we have completed a health risk screening analysis for the above referenced permit application. The analysis estimates the incremental health risk resulting from toxic air contaminant (TAC) emissions from operation of a [standby generator diesel engine and 14 natural gas engines](#) at this facility. Results from the health risk screening analysis indicate that the maximum cancer risk is estimated at [3.9](#) in a million. In accordance with the District's Regulation 2-5, this risk level [is](#) considered acceptable [as the engine meets current TBACT requirements](#).

**EMISSIONS:** The emission rates for toxic air contaminants (TAC) were calculated based on the following assumptions:

1. Each IC Engine will operate intermittently (4000 hours per year) at a firing rate of 72.8 MMBTU/hr. There are a total of 14 engines. TAC emissions estimates were made using emission factors from the CARB CATEF database for Natural Gas Fired IC Engines >650 hp, lean-burn engines. The engines will have an abatement efficiency of 40% (Oxidation Catalyst). See Table #1
2. Diesel Engine will operate 50 hours for testing and maintenance purposes, 369 BHP hr,

Source	PM Emission Factor (g/bhp-hr)	Horsepower	Annual Usage (hours/year)	Diesel PM Emissions (lb/year)
<a href="#">S15</a>	<a href="#">0.1118</a>	<a href="#">369</a>	<a href="#">50</a>	<a href="#">4.5434</a>

**MODELING:** The ISCST3 air dispersion computer model was used to estimate annual average and maximum 1-hour ambient air concentrations. The model was run with [Union City \(5 year\)](#) meteorological data, [emission rate scalars to account for operations that occur only during normal working hours](#) and [Hayward](#) terrain data. Model runs were made with [urban](#) dispersion coefficients. In addition, to be more conservative a gradual plume rise was used. Stack and building parameters for the analysis were based on information provided by the applicant.

**HEALTH RISK:** Estimates of residential risk assume potential exposure to annual average TAC concentrations occur 24 hours per day, 350 days per year, for a 70-year lifetime. Risk estimates for offsite workers assume potential exposure occurs 8 hours per day, 245 day per year, for 40 years. The estimated health risks for this permit application are presented in the table below.

Sources 1-14 (Natural Gas Engines)

Receptor	Cancer Risk	Non-cancer Chronic Hazard Index (HI)	Max. Acute Non-cancer HI
Resident	0.32 in a million	<a href="#">0.005</a>	<a href="#">0.028</a>
Worker	3.54 in a million	<a href="#">0.065</a>	<a href="#">0.066</a>

Source 15 (Diesel Engine)

Receptor	Cancer Risk	Non-cancer Chronic Hazard Index (HI)
Resident	0.0113 in a million	0.0000068
Worker	0.63 in a million	0.00045

Sources 1-15 Cumulative at maximum point of impact

Receptor	Cancer Risk	Non-cancer Chronic Hazard Index (HI)	Max. Acute Non-cancer HI
Resident	0.3305 in a million	0.0050	0.028
Worker	3.856 in a million	0.06522	0.066

Including the compound Acrolein, the results are as follows:

Sources 1-14 (Natural Gas Engines)

Receptor	Cancer Risk	Non-cancer Chronic Hazard Index (HI)	Max. Acute Non-cancer HI
Resident	0.32 in a million	0.008	0.201
Worker	3.54 in a million	0.104	0.470

No Change in the diesel engine

Sources 1-15 Cumulative at maximum point of impact

Receptor	Cancer Risk	Non-cancer Chronic Hazard Index (HI)	Max. Acute Non-cancer HI
Resident	0.3305 in a million	0.0080	0.201
Worker	3.856 in a million	0.10422	0.470